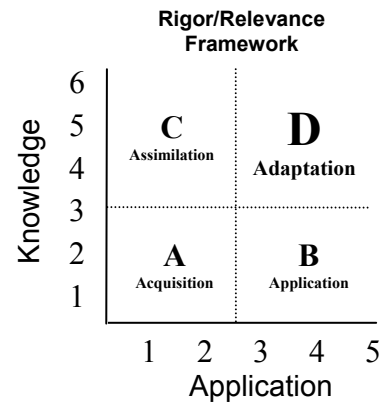




Gold Seal Lesson

QUILT DESIGN



Subject

MATHEMATICS

Grades K-4

Instructional Focus

Tools and Technology: Students use appropriate tools and technologies to model, measure, and apply the results in a problem-solving situation. Students communicate the reasoning used in solving these problems.

Measurement: Students use a variety of tools and techniques of measurement in a problem-solving situation. Students communicate the reasoning used in solving these problems.

Algebraic Concepts and Relationships: Students use algebraic methods to investigate, model, and interpret patterns and functions involving numbers, shapes, data, and graphs in a problem-solving situation. Students evaluate and communicate the reasoning used in solving these problems.

Geometry: Students apply geometric concepts, properties, and relationships in a problem-solving situation. Students communicate the reasoning used in solving these problems.

Problem-Solving and Mathematical Reasoning: Students apply a variety of problem-solving strategies to investigate and solve problems from across the curriculum as well as from practical applications.

Performance Task

Designing a quilt provides an opportunity for students to use transformational geometry, measurement, and area. In this exercise, students will use geometric shapes to make a geometric pattern. The most frequently used shapes will be rectangles, squares, and triangles.

1. Choose four different colors and determine the shapes to be used, as well as the size of the final product.
2. Have students work in pairs or in groups of three. Give each pair or group of students a piece of white construction paper that they will use to design their quilt. The construction paper should be the shape and size of the square to be used in the final product that has been decided upon by the teacher (e.g., a 10"X10" square).
3. Tell the students which four shapes, the dimensions of those shapes, and the colors to use. Have each group design a quilt pattern using the requirements they have received, and then draw and color their pattern on the construction paper. Inform them that the goal is to achieve a final design that is mathematically correct and is aesthetically appealing.

Performance Task continued

4. Upon completion of the designs by each group, have the class vote on choosing the single design that will be used to make the quilt. A quilt will be made using this pattern.

Teacher notes: In consultation with the students in your class, a decision could be made to raffle off for the quilt and give the proceeds to a charity, or to give the quilt to a local nursing home or to the children's ward in a local hospital.

Scoring Guide

Final Pattern

4 Points = The design satisfies all components of the task. It is complete and logical. It is neat and shows an understanding of reflection, rotation, transformation, and symmetry. The design pattern uses all of the shapes and colors. The final product is attractive and shows a clear understanding of the task.

3 Points = The design satisfies most of the components of the task. It is complete but the design could be more organized. The design pattern uses most of the shapes and colors. It is neat and shows an understanding of reflection, rotation, transformation, and symmetry. The final product is attractive and shows some understanding of the task.

2 Points = The design is missing a major component of the task. It is incomplete and the design is not organized. The design pattern uses some but not all of the shapes and colors. It is relatively neat but shows some lack of understanding of reflection, rotation, transformation, and symmetry. The final product is somewhat pleasing but needs more attention. It shows a lack of a full understanding of the task.

1 Point = The design satisfies few if any components of the task. There is no discernable pattern and the design is illogical. Few shapes and colors have been used. It is not neat, and there is no understanding shown for the task or the concepts taught.

Essential Skills

- Compute the perimeter and area of two-dimensional figures. (m13)
- Understand the properties and classification of polygons (e.g., triangle, quadrilaterals, pentagon, hexagon, etc.) as well as knowledge of geometric shapes. (m26)
- Understand the properties and classification of quadrilaterals by orientation (e.g., parallelogram, rectangle, rhombus, square, and trapezoid). (m27)
- Understand and use various techniques for estimating, making and converting measure; and using these to perform dimensional analysis. (m33)
- Apply transformation concepts to understand and create congruent and similar figures. (m49)
- Understand the concepts of symmetry and transformations and graphically apply line reflections, rotation, translations, and dilation. (m55)